limit periodic cases), Three-term recurrences (Pincherle's and Auric's theorems and generalizations), and Correspondence, respectively. Chapters VI, VII, and VIII give a taste of the connections with hypergeometric functions, moments and orthogonality, and Padé approximants, respectively. The final four chapters have applications to number theory, zero-free regions of polynomials, digital filter theory, and differential equations. The Appendix is an (admittedly incomplete) catalogue of known continued fraction expansions. Although there are some references at the end of each chapter, there is, unfortunately, no overall bibliography. A Subject Index completes the text.

The book is recommended as a tasteful introduction to continued fractions, which will stimulate an appetite for further reading and prepare one for digesting current research on the subject.

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1. R. Askey and J. Wilson, *Some basic hypergeometric orthogonal polynomials that generalize Jacobi polynomials*, Mem. Amer. Math. Soc. **319** (1985).
2. W. B. Jones and W. J. Thron, *Continued fractions: Analytic theory and applications*, Addison-Wesley, Reading, Mass., 1980.
3. O. Perron, *Die Lehre von den Kettenbrüchen, Band* I: *Elementare Kettenbrüche*, Teubner, Stuttgart, 1954.
4. O. Perron, *Die Lehre von den Kettenbrüchen, Band* II: *Analytisch-funktionentheoretische Kettenbrüche*, Teubner, Stuttgart, 1957.
5. H. S. Wall, *Analytic theory of continued fractions*, Van Nostrand, New York, 1948.

2[01-00, 11A55, 30B70, 40A15, 41A21, 65B10].—CLAUDE BREZINSKI, *History of Continued Fractions and Padé Approximants*, Springer Series in Computational Mathematics, Vol. 12, Springer-Verlag, Berlin, 1991, 551 pp., 24 cm. Price $79.00.

As the author admits in the Introduction to this book, he realized soon after having embarked on the project of writing a history of continued fractions that he had neither the time nor the inclination to write a complete history of the subject. Thus he restricted himself to presenting "a collection of facts and references about continued fractions." Moreover, "this history ends with the first part of our century, that is, 1939."

The contents of the book are fairly well described by the titles of the sections of the book, which are as follows:

1. Euclid's algorithm, the square root, indeterminate equations, history of notations.

2. Ascending continued fractions, the birth of continued fractions, miscellaneous contributions, Pell's equation.

3. Brouncker and Wallis, Huygens, number theory.

4. Euler, Lambert, Lagrange, miscellaneous contributions, the birth of Padé approximants.

5. Arithmetical continued fractions, algebraic properties, arithmetic, applications, number theory, convergence, algebraic continued fractions, expansion

methods and properties, examples and applications, orthogonal polynomials, convergence and analytic theory, Padé approximants, varia.

6. Number theory, set and probability theories, convergence and analytic theory, Padé approximants, extensions and applications.

All important aspects and applications of the theory of continued fractions are thus at least touched upon. The area most thoroughly covered is that of continued fraction approximation to power series, in particular, Padé approximation.

Appended to the text are two impressive bibliographies. The first consists of 2302 items which contain "almost all" contributions to the theory of continued fractions up to 1939. There are at least two instances (von Koch, Śleszyński) where a certain article is listed twice. Also Worpitzky's article of 1862 is missing.

A compilation extending to 1988 was recently published by the same author [1].

The second bibliography has 478 entries and lists books and articles containing historical material. There are also indexes of collected works, names, and subjects.

The information gathered by Brezinski is impressive and very useful to people interested in the field. Unfortunately, the author, at least in the reviewer's opinion, misjudges the English-speaking readers' ability to read French. Thus the inclusion of a large number of quotations (some of them several pages long) in French appears to be of little use to the average reader.

There are the usual typographical errors and some factual errors. Thus, Śleszyński in 1888 proved the criterion

$$K(a_n/b_n) \quad \text{converges if for all } n \geq 1, \quad |b_n| \geq |a_n| + 1.$$

The author (p. 189) (as have many mathematicians before him) credits Pringsheim (1898) with the result.

In 1917 Schur initiated a study of functions bounded in the unit disk. One of his main tools was a "continued-fraction-like" algorithm. Brezinski (p. 306) states that he used a certain continued fraction (which essentially appears to be due to Hamel). The approach used by Schur is credited (p. 290) to R. Nevanlinna.

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1. C. Brezinski, *A bibliography on continued fractions, Padé approximation, sequence transformation and related subjects*, Prensas Universitarias, Zaragoza, 1991.

3a [65-00, 65-04].—William H. Press, Saul A. Teukolsky, William T. Vetterling & Brian P. Flannery, *Numerical Recipes in Fortran: The Art of Scientific Computing*, 2nd ed., Cambridge Univ. Press, Cambridge, 1992, xxvi+963 pp., 25 cm. Price $49.95.

3b [65-00, 65-04].—William H. Press, Saul A. Teukolsky, William T. Vetterling & Brian P. Flannery, *Numerical Recipes in C: The Art of Scientific*